Redridge Steel Dam
Across the Salmon Trout River
Beacon Hill
Houghton County
Michigan

HAER No. MI-10

PHOTOGRAPHS

HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
Washington, D. C. 20240

# HISTORIC AMERICAN ENGINEERING RECORD

## Redridge Steel Dam

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| Location: | Across the Salmon Trout River, Beacon Hill, Houghton County, Michigan. |
| UTM: | 16.366260.5223000 |
| Dates of Construction: | 1901 |
| Designer/Builder: | J. F. Jackson, engineer, Wisconsin Bridge and Iron Company |
| Owner: | Atlantic Mining Company |
| Use: | No longer in operation. |
| Significance: | The water supply impounded by the log dam, built by the Atlantic Mining Company across the Salmon Trout River in 1894, proved inadequate when the Baltic Mining Company built a stamp mill on Lake Superior just west of the river. Accordingly, the two mining companies decided to jointly build a new dam and share the larger water supply. Because of the lack of suitable stone in this region, they decided to build a steel gravity dam, making this structure only the second dam of that design in the United States and the first of any significant size. It was preceded by a 46 foot high, 184 foot long dam near Ash Fork, Arizona, constructed by the Wisconsin Bridge and Iron Company in 1897-1898. The Redridge Dam was designed by J. F. Jackson, engineer for the Wisconsin Bridge and Iron Company, with F. Foster Cromwell, hydraulic engineer from New York, serving as the consulting engineer. The entire project cost $150,000, with the foundations accounting for $90,000 of the total. The excavation work was performed by Atlantic Mining Company employees under the direction of F. G. Coggin, Jr., superintendent of the company's stamp mill. The contracting firm of Prendergast and Clarkson of Chicago did the concrete work, |

while the steel was fabricated and erected by the Wisconsin Bridge and Iron Company. Overall, the structure is 1,006 feet long and two earth embankment wings with concrete core walls. The center portion of the dam required 8,000 cubic yards of concrete, while another 2,000 cubic yards was used in the core walls, and 500 tons of steel plates and girders were used. The main dam rests on a solid concrete foundation 64 feet thick, varying in height from 14 feet to 38 feet, resting on bedrock. It is comprised of five main sections, with the tallest or center section standing 74 feet high. The dam consists of steel boilerplates, 8 feet by 16 feet, riveted and caulked, with a concave shape on the upstream side. In the lower section of the dam, these plates are three-sixteenths of an inch thick and rest directly against the concrete base, while in the upper portion they are three-eighths of an inch thick and are supported by parallel inclined steel I-beams 2 feet deep, which in turn are supported by heavy triangular frameworks of inclined steel columns and struts. The upper portion of the dam is inclined at an angle of 45 degrees from the water. The flow of water from the dam to the two mills was controlled by three 24-inch intakes, with the two on the west end of the dam connected to a 38-inch riveted steel pipeline leading to the Baltic mill some 2,200 feet away. In addition, there are four 24-inch discharge pipes in the center of the concrete base, each fitted with a sliding external gate and a gate valve. Finally, there was a waste weir built approximately 350 feet long, tapering in width from 50 feet to 30 feet, leading to a timber flume, 30 feet wide, 4 feet deep, and 400 feet long, discharging back into the river. This remarkable structure created a reservoir of 600 million gallons, ample storage for the two mills, which used an average of 25.5 million gallons daily.

(F. H. Bainbridge, "Structural Steel Dams," Engineering News, LIV (19o05), pp. 323-324; F. H. Bainbridge, "Structural Steel Dams," Journal of the Western Society of Engineers, X (1905), pp. 615-631; Houghton Daily Mining

Gazette, October 7, 1967, pp. 1, 9; J. F. Jackson, "Copper Mining in Upper Michigan," Journal of the Western Society of Engineers, VIII (February 1903), pp. 15-16; J. F. Jackson, "Four Steel Dams: Their Design and History," Engineering News-Record, CIV (1930), p. 281; James Dix Schuyler, Reservoirs for Irrigation, Water Power, and Domestic Water Supply (New York, 1912), pp. 456-459; Stevens, I (1900), pp. 254-256; C. Maxwell Stanley, "Why Not Steel Dams?", Engineering News-Record, CIX (1932), pp. 652, 658; "The Redridge Dam," Engineering News, XXXXVI (1901), pp. 101-102)

Transmitted by: Jean P. Yearby, from data compiled by Charles K. Hyde, 1984.